

46.(Amended) A speaker system comprising four speaker assemblies, a first one of said speaker assemblies mounted in front of a listening area, a second one of said speaker assemblies mounted to the rear of said listening area, a third one of said speaker assemblies mounted to the right of said listening area and a fourth one of said speaker assemblies mounted to the left of said listening area, wherein each of said assemblies [comprise] comprises two or more fixed speakers mounted in a predetermined position with respect to each other, wherein each of said speakers includes one or more acoustic transducers, said speakers being responsive to a plurality of audio input signals from one or more signal processors.

Pending Claims

1. A method for modifying the acoustic effect of an array of two or more speakers responsive to a plurality of audio input signals from one or more signal processors, wherein each of said speakers is comprised of one or more acoustic transducers, comprising:

providing one or more parameters derived from the physical relational characteristics of said speakers; and

using at least one of said parameters to modify said audio input signals.

2. The method of claim 1, wherein said physical relational characteristics include the distances between said two or more speakers.

3. The method of claim 1, wherein said two or more speakers are in the same enclosure.

4. An apparatus comprising:
two or more speakers, each of said speakers comprised of one or more acoustic transducers;

a measuring device to determine one or more physical relational characteristic of said speakers;

an input circuit that provides one or more parameters derived from said physical relational characteristics of said speakers to said signal processors; and

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at least one signal processor to apply acoustic processing to signals driving said plurality of acoustic transducers, wherein said acoustic processing is responsive to at least one of said parameters.

5. The apparatus of claim 4, wherein said speaker array comprises two speakers arranged in an enclosure which holds them a specified separation distance apart, and wherein said specified separation distance is fixed.

6. The apparatus of claim 4, wherein said speaker array comprises two speakers arranged in an enclosure which holds them a specified separation distance apart, and wherein said specified separation distance is adjustable.

7. The apparatus of claim 4, wherein said speaker array comprises:
a first speaker assembly placed in front of a listening area; and
a second speaker assembly placed to the rear of said listening area.

8. The apparatus of claim 7, wherein said speaker array further comprises:
a third speaker assembly placed to the left of said listening area; and
a fourth speaker assembly placed to the right of said listening area.

9. The apparatus of either of claims 7 or 8, wherein said physical relational characteristics include the relative locations of each of the two speaker assemblies.

10. A speaker assembly, comprising two fixed speakers mounted in a predetermined position with respect to each other, wherein each of said speakers includes one or more acoustic transducers, said speakers being responsive to a plurality of audio input signals from one or more signal processors, wherein said audio input signals are derived based on fixed input parameters determined by said predetermined position.

11.(Amended) A speaker system comprising two speaker assemblies, a first one of said speaker assemblies mounted in front of a listening area and a second one of said

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speaker assemblies mounted behind said listening area, wherein each of said assemblies comprises two or more fixed speakers mounted in a predetermined position with respect to each other, wherein each of said speakers includes one or more acoustic transducers, said speakers being responsive to a plurality of audio input signals from one or more signal processors, wherein said audio input signals are derived based on fixed input parameters determined by said predetermined positions.

12.(Twice Amended) A speaker system comprising four speaker assemblies, a first one of said speaker assemblies mounted in front of a listening area, a second one of said speaker assemblies mounted to the rear of said listening area, a third one of said speaker assemblies mounted to the right of said listening area and a fourth one of said speaker assemblies mounted to the left of said listening area, wherein each of said assemblies comprises two or more fixed speakers mounted in a predetermined position with respect to each other, wherein each of said speakers includes one or more acoustic transducers, said speakers being responsive to a plurality of audio input signals from one or more signal processors, wherein said audio input signals are derived based on fixed input parameters determined by said predetermined positions.

13. A speaker enclosure for providing enhanced two channel sound in response to a first and a second input signal, said enclosure comprising:

a pair of speakers, wherein a first of said speakers is responsive to said first input signal and a second of said speakers is responsive to said second input signal; and

an enclosure for said pair of speakers to hold them in a specified physical relation, wherein said enclosure provides data based on said specified physical relation as an output signal.

14. The speaker system of claim 13, wherein said specified physical relation is adjustable.

15. The speaker system of claim 14, wherein said speakers are essentially identical.

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16. The speaker system of claim 15, wherein each of said speakers comprise a single acoustic transducer.

17. The speaker system of claim 15, wherein said specified physical relation comprises the distance between said speakers.

18. A method of processing audio signals for use in a plurality of speakers for the acoustic display of aural information, wherein some of the reproduced aural information appears to a listener to emanate from a virtual source which is spaced from the speakers, comprising:

receiving a plurality of audio signals;

providing one or more input parameters, wherein at least one of said input parameters is derived from the relative physical characteristics of said plurality of speakers;

producing a plurality of enhanced output signals for use in said speakers, wherein said output signals are derived from said plurality of audio signals in response to said one or more input parameters.

19. The method of claim 18, wherein said relative physical characteristics include the relative position of said plurality speakers.

20. The method of claim 18, wherein said relative physical characteristics include the relative alignment of said plurality speakers.

21. The method of claim 18, wherein said relative physical characteristics include the relative compliance of said plurality speakers.

22. The method of claim 18, wherein said plurality of speakers are contained within enclosures, and wherein said relative physical characteristics include the relative compliance of said enclosures.

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23. A sound reproduction system comprising:
a first speaker array comprising:

a pair of essentially identical speakers each comprising a single acoustic transducer, wherein a first of said speakers is responsive to a first input signal and a second of said speakers is responsive to a second input signal; and

an enclosure for said pair of single driver speakers to hold them in a specified physical relation, wherein said enclosure provides data based on said specified physical relation as an output signal; and

a signal processor for providing said first and second input signals comprising:
an audio input circuit to receive a plurality of audio signals;

a parameter circuit to receive one or more first input parameters, wherein at least one of said first input parameters is derived from said output signal provided by said first speaker array; and

an output circuit coupled to said parameter circuit to provide said input signals, wherein said input signals are derived by said output circuit from said plurality of audio signals in response to said one or more first input parameters.

24. The sound reproduction system of claim 23, wherein said specified physical relation is adjustable.

25. The sound reproduction system of claim 24, wherein said specified physical relation includes the distance between said pair of isolated speakers.

26. A sound reproduction system, wherein some of the reproduced sound appears to a listener to emanate from a virtual source which is spaced from the speakers, comprising:

a first speaker array comprising:

a plurality of speakers, wherein said speakers are responsive to one or more of a plurality of input signals; and

a signal processor for providing said plurality of input signals comprising:
an audio input circuit to receive a plurality of audio signals;

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a parameter input circuit to receive one or more first input parameters, wherein at least one of said first input parameters is derived from the relative physical characteristics of said first speaker array; and

an output circuit coupled to said parameter input circuit to provide said plurality of input signals, wherein said input signals are enhanced signals derived by said output circuit from said plurality of audio signals in response to said one or more first input parameters.

27. The sound reproduction system of claim 26, wherein said first speaker array further comprises an enclosure for holding said speakers in a specified physical relation.

28. The sound reproduction system of claim 27, wherein said plurality of speakers is a pair of essentially identical speakers each comprising a single acoustic transducer.

29. The sound reproduction system of claim 26, wherein said relative physical characteristics include the relative position of said plurality speakers.

30. The sound reproduction system of claim 29, wherein said first speaker array further comprises:

a locator to provide data derived from the spatial relation of said first speaker array; and

wherein said relative position of said plurality speakers is derived from said data.

31. The sound reproduction system of claim 26, wherein said relative physical characteristics include the relative alignment of said plurality speakers.

32. The sound reproduction system of claim 26, wherein said relative physical characteristics include the relative compliance of said plurality speakers.

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33. The sound reproduction system of claim 26, wherein said plurality of speakers are contained within enclosures and wherein said relative physical characteristics include the relative compliance of said enclosures.

34. The sound reproduction system of either of claims 25 or 29, wherein said first speaker array is located in front of said listener, further comprising:

a plurality of rear speakers located to the rear of said listener, wherein said rear speakers are responsive to one or more of a plurality of rear input signals;

a rear audio input circuit to receive said plurality of audio signals; and

a rear output circuit to provide said plurality of rear input signals, wherein said rear input signals are derived by said rear output circuit from said plurality of audio signals.

35. The sound reproduction system of either of claims 25 or 29, wherein said first speaker array is located in front of said listener, further comprising:

a rear speaker array comprising:

a plurality of rear speakers located to the rear of said listener, wherein said rear speakers are responsive to one or more of a plurality of rear input signals; and

a rear signal processor for providing said plurality of rear input signals comprising:

an rear audio input circuit to receive said plurality of audio signals;

a rear parameter input circuit to receive one or more rear input parameters, wherein at least one of said rear input parameters is derived from the relative physical characteristics of said rear speaker array; and

a rear output circuit coupled to said rear parameter input circuit to provide said plurality of rear input signals, wherein said rear input signals are derived by said rear output circuit from said plurality of audio signals in response to said one or more rear input parameters.

36. The sound reproduction system of claim 35, wherein at least one of said first input parameters and said rear input parameters are derived from the relative position said rear speaker array with respect to said first speaker array.

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37. The sound reproduction system of claim 35, wherein said front and rear signal processors are combined in a single circuit.

38. The sound reproduction system of claim 35, wherein said rear input signals are enhanced multichannel signals.

39. A sound reproduction system for providing the acoustic display of aural information to a listener, wherein some of the reproduced aural information appears to said listener to emanate from a virtual source which is spaced from the speakers, comprising:

a pair of front speakers placed in front of said listener, wherein a first of said front speakers is responsive to a first front input signal and a second of said front speakers is responsive to a second front input signal;

a pair of rear speakers placed to the rear of said listener, wherein a first of said rear speakers is responsive to a first rear input signal and a second of said rear speakers is responsive to a second rear input signal; and

at least one signal processor to supply said front and rear input signals, wherein said input signals are enhanced signals derived by said at least one signal processor from a plurality of audio signals in response to the relative physical characteristics of said speakers.

40. The sound reproduction system of claim 39, further comprising:

a pair of left speakers placed to the left of said listener, wherein a first of said left speakers is responsive to a first left input signal and a second of said left speakers is responsive to a second left input signal; and

a pair of right speakers placed to the right of said listener, wherein a first of said right speakers is responsive to a first right input signal and a second of said right speakers is responsive to a second right input signal; and

wherein said at least one signal processor additionally supplies said left and right input signals.

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41. The sound reproduction system of either of claims 39 or 40, wherein said relative physical characteristics comprise the relative positions of said speakers.

42. A method of processing audio signals for providing first and second output signals for use in a pair of essentially identical speakers for the acoustic display of aural information, the first of said speakers responsive to said first output signal and the second of said speakers responsive to said second output signals, comprising:

receiving a plurality of audio signals;

providing one or more input parameters, wherein at least one of said input parameters is derived from the physical characteristics of said pair of speakers; and

producing said output signals, wherein above a first frequency, said first and second output signals are independent, and in a range of frequencies below said first frequency, said first and second output signals are the same, and wherein said first frequency is derived by said output circuit from said plurality of audio signals in response to said one or more input parameters.

43. The method of claim 42, wherein said physical characteristics includes the size of said speakers.

44. The method of claim 42, wherein said output signals are enhanced signals.

45.(Amended) A speaker system comprising two speaker assemblies, a first one of said speaker assemblies mounted in front of a listening area and a second one of said speaker assemblies mounted behind said listening area, wherein each of said assemblies comprises two or more fixed speakers mounted in a predetermined position with respect to each other, wherein each of said speakers includes one or more acoustic transducers, said speakers being responsive to a plurality of audio input signals from one or more signal processors.

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